Universiti Teknologi MARA

IoT Based Human Comfort Index Monitoring System

Nur Syahirah Aqilah Bt Samsul Bahri

Thesis submitted in fulfilment of the requirements for Bachelor of Science (Hons) Data Communications and Networking

Faculty of Computer and Mathematical Sciences

July 2019

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and the Most Merciful. Alhamdulillah, praise and thanks to Allah SWT, for all the graces and blessings and also Selawat and Salam to the Prophet Rasulullah SAW, hopefully His syafa‟at will be abundant in days later.

First of all, I would like to express my highest gratitude to my supervisor, Dr. Hj. Mohd Izani Mohamed Rawi fo his guidance, advice and support in order to complete this final year project. I appreciate every single “walk” he taught me.

Thanks also to all the lecturers in the course of Bachelor of Science (Hons) Networking & Data Communications at UiTM Shah Alam for their patience and kind advice during the process of completing the project.

Special appreciation goes to my mother, and father, Samsul Bahri Bin Abdul Aziz, including my inspiring brothers, that always motivated me to carry on.

Lastly, thanks you so much to all those who supporting me in any way during the completions of this proposal report by discussing, sharing or exchanging ideas and everyone who are directly or indirectly involved in writing this report.

Thank you so much.

ABSTRACT

This study explored the features of Internet of Things (IoT) in addressing the problem of a comfort in living spaces also monitoring and maintaining the condition of a small living spaces such as small office room, small reading room or a single bedroom. Sometimes the room is too cold or maybe the light is too bright that it can disturb the individual daily activities especially during at work. This could slow down the productivity of a human performance making it hard for the person to give a full concentration in fulfilling their task. This thesis purpose is to design and develop prototype a human comfort automation system so that it can provide a comfortable and a healthy place for people to live in. This project will use a few sensors which these sensors will calculate the values of light level (lux), temperature (°C), humidity (%), pressure (hPa) and altitude (m). All the values from the sensors will then be taken to perform some calculations to get the actual Thermal Comfort and Visual comfort values. And from these comfort values, the main values which is the Human Comfort Index can be determine. The result from this study can be applied and used in any occupied building spaces in order to achieve a pleasant and comfy environment.

Table of Contents

Chapter 1: Introduction

1.1 BACKGROUND STUDY

Internet of Things (IoT) is a proposed development of the Internet in which it connects everyday objects to certain network connectivity and so, it allows the objects to send and receive data from the network connectivity itself. With this new development, these devices are intelligently interconnected and creates a new form of communication between objects and people, and among the devices itself. Thus, this interconnection between devices or object helps us humans (people) make it easier, save electricity, have more security and enhances the safety of property. This type of communication is the basic that drives the growth of automation technology in home and technology industries (Abdulrahmana, Isiwekpenia, Surajudeen-Bakindea, & Otuozea, 2016).

The realm of the traditional desktop will be out of reach once the next era of computing is generated. In the IoT paradigm, everyday objects around us will be connected through a certain network. While Radio Frequency Identification (RFID) and sensor network technologies will have to try their best to meet this new challenge in which information and communication systems are secretly incorporated into the environment. Thus, it creates a vast amount of data which must be stored, processed and presented in a much smooth, efficient and clearly interpretable form. Nowadays, computing has been providing us with virtual infrastructure which includes integration of analytic tools, visualization platforms and client delivery. Fortunately, computing also combined monitoring and storage devices. Businesses and users can now access applications on demand from anywhere throughout the world using the end-to-end service provisioning which was offered by Cloud Computing (Gubbi, Buyyab, Marusic, & Palaniswami, 2013)

By utilizing the information from IoT into the housing industry and buildings, the smart home and building is created where there are built-in sensors that are attached to household or in the building. It will be attached to a certain place depends on what kind of problem that we are trying to ease it.